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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,687	02/05/2004	Bulent M. Basol	NVLUS.023CPI	4890

20995 7590 10/12/2007
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EXAMINER

WONG, EDNA

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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10/12/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
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Office Action Summary

Application No.

10/772,687

Applicant(s)

BASOL, BULENT M.

Examiner

Edna Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: _____ |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :August 9, 2004, December 5, 2005 and July 17, 2006.

Election/Restrictions

Applicant's election without traverse of Group I, claims **1-6**, in the reply filed on September 17, 2007 is acknowledged.

The requirement is still deemed proper and is therefore made FINAL.

Accordingly, claims **7-18** are withdrawn from consideration as being directed to a non-elected invention.

Specification

The disclosure is objected to because of the following informalities:

page 1, line 3, the words -- now US Patent No. 7,189,146 B2, -- should be inserted after "(NT-294),".

page 6, line 15, the word "Excess" should be amended to the word -- excess --.

page 7, line 29, the words -- (not shown) -- should be inserted after the number "202".

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

Claims **3 and 4** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3

line 2, it appears that the "gases" are the same as the gases recited in claim 1, line 5. However, it is unclear if they are. If they are, then it is suggested that the word -- the -- should be inserted after the word "with" (in claim 3, line 1). If they are not, then what is the relationship between the gases?

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d)

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may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 7,189,146 B2 (Basol et al.). Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

1. A method of processing a surface of a layer on a workpiece, the method comprising: removing a flow of a process solution from a solution container to a degasser; **degassing** the process solution in the degasser to form a degassed process solution; delivering the degassed process solution back to the solution container from the degasser without passing the degassed process solution through a processing unit; processing in the processing unit the surface of the layer using the solution from the solution container, the processing unit comprising a plurality of separate workpiece processing stations, separately controlling a flow rate of the process solution through the degasser from a flow rate of the process solution through the plurality of separate workpiece processing stations.

7. The method of claim 1, wherein degassing comprises reducing dissolved gas content in the solution.

8. The method of claim 1, wherein **degassing comprises lowering dissolved oxygen content of the process solution** and configuring the process solution to reduce consumption of organic additives during the step of processing.

9. The method of claim 7, wherein reducing the dissolved gas content comprises reducing the dissolved content of oxygen, nitrogen, carbon dioxide, and hydrogen in the process solution.

16. A method of depositing layers on workpiece surfaces, comprising: supplying a process solution from a first outlet of a solution container to an inlet of a degasser; degassing the process solution from the solution container using the degasser to form a degassed process solution; delivering the degassed process solution to an inlet of the solution container from an outlet of the degasser; providing a processing unit having a plurality of processing stations; providing workpieces in the processing stations; wetting surfaces of the workpieces in the processing stations with the process solution from a second outlet of the solution container; and **depositing the layers** after wetting the workpiece surfaces, separately controlling a flow rate of the process solution through the degasser from a flow rate of the process solution through the plurality of

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processing stations.

21. A method of forming copper films on copper seed layers of workpieces using an electrochemical deposition process, the method comprising: providing a processing unit having a plurality of processing stations; providing workpieces in the processing stations, each workpiece having a copper seed layer; supplying a process solution from a solution container to a degasser; degassing the process solution using the degasser to form a degassed process solution; delivering the degassed process solution to the solution container from the degasser without passing the degassed process solution through the processing unit; supplying solution from the solution container to the processing stations of the processing unit; separately controlling a flow rate of the process solution through the degasser from a flow rate of the process solution through the plurality of processing stations; immersing the copper seed layers layer in the process solution delivered to the processing stations; and for each workpiece, **applying a potential** between the copper seed layer and an electrode in electrical communication with the process solution.

23. A method of forming copper films on surfaces of workpieces using an electroless deposition process, the method comprising: providing a processing unit having a plurality of processing stations; providing workpieces in the processing stations; supplying a process solution from a solution container to a degasser; degassing the process solution using the degasser to form a degassed process solution; delivering the degassed process solution to the solution container from the degasser without passing the degassed process solution through the processing unit; supplying the solution from the solution container to the processing stations of the processing unit; immersing surfaces of the workpieces in the process solution delivered to the processing stations; and depositing the **copper films** out of the degassed process solution after immersing the surfaces.

The independent claims of the instant application recites similar limitations, either alone or in combination with their dependent claims, as that of the claims of the patent wherein the claims of the instant application are encompassed by the claims of the patent. The subject matter claimed in the instant application is fully disclosed in the referenced patent and would be covered by the granted patent. Therefore, the claims would have been obvious variants over each other.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **1-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Andricacos et al.** (US Patent No. 6,331,237 B1) in combination with **Plambeck, Jr.** (US Patent No. 4,130,706).

Andricacos teaches a method of electrochemically processing a conductive surface (= a seed layer) of a workpiece (= a semiconductor wafer) [col. 4, lines 25-34] using a process solution (= a plating solution) [col. 4, lines 49-56], comprising the steps of:

(a) deoxygenating the process solution to substantially remove oxygen from the process solution (= the level of oxygen may be reduced by more than 99%) [col. 5, lines 54-55]; and

(b) electrochemically processing the surface of the workpiece (= electroplating) [col. 3, lines 56-62; and col. 4, lines 18-21] with the process solution that is deoxygenated and degassed (= the plating solution is supplied from the reservoir **1** to a plating cell **2** through a circulation path having a supply line **3** and a return line **4**) [col. 5, lines 21-27; and Fig. 2].

The step of deoxygenating comprises introducing a treatment gas into the process solution (= a very effective means of reducing the oxygen concentration at the wafer surface is the deaeration of plating solution by bubbling an inert gas) [col. 5, lines 1-4].

The step of processing comprises electrochemical deposition (= electroplating) [col. 3, lines 56-62; and col. 4, lines 18-21].

The electrochemical deposition comprises copper electrodeposition (= electroplating particularly copper) [col. 3, lines 56-62; and col. 4, lines 18-21].

The method of Andricacos differs from the instant invention because Andricacos does not disclose the following:

- a. Degassing the process solution, after deoxygenating, to remove gases, as recited in claim 1.
- b. Wherein the step of degassing removes the treatment gas along with gases from the process solution, as recited in claim 3.

Andricacos teaches that a very effective means of reducing the oxygen concentration at the wafer surface is the deaeration of plating solution by bubbling an inert gas) [col. 5, lines 1-4]. The present invention also concerns a deaerated plating solution (col. 6, lines 1-2). The solution may also include an inert gas dissolved therein. However, it is not necessary that the solution include any dissolved inert gas (col. 6, lines 5-7).

Plambeck, Jr. teaches deoxygenating a solution by bubbling oxygen-free nitrogen through it, and degassing by applying a vacuum to it (col. 8, lines 12-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Andricacos by degassing the process solution, after deoxygenating, to remove gases because Andricacos teaches that it was not necessary that the solution included any dissolved

inert gas (col. 6, lines 5-7), and applying a vacuum would have degassed such a deoxygenated solution as taught by Plambeck, Jr. (col. 8, lines 12-14).

Furthermore, although Andricacos teaches that the deaeration of the plating solution was by bubbling with an inert gas (col. 5, lines 1-4), why wouldn't this step also degas the process solution to remove the dissolved inert gas (col. 6, lines 5-7)?

It has been shown that the transpositioning of varying steps, or varying the details of a process, as by adding a step or splitting one step into two does not avoid obviousness where the processes are substantially identical or equivalent in terms of function, manner and result. *General Foods Corp. v. Perk Foods Co.* (DC NIII 1968) (157 USPQ 14); *Malignani v. Germania Electric Lamp Co.*, 169 F. 299, 301 (D.N.J. 1909); *Matrix Contrast Corp. v. George Kellar*, 34 F.2d 510, 512, 2 USPQ 400, 402-403 (E.D.N.Y 1929); *Hammerschlag Mfg. Co. v. Bancroft*, 32 F. 585, 589 (N.D.III.1887); *Procter & Gamble Mfg. Co. v. Refining*, 135 F.2d 900, 909, 57 USPQ 505, 513-514 (4th Cir. 1943); *Matherson-Selig Co. v. Carl Gorr Color Gard, Inc.*, 154 USPQ 265, 276 (N.D.III.1967).

c. Wherein the degassing step further reduces the amount of remaining oxygen, as recited in claim 4.

Plambeck, Jr. teaches deoxygenating a solution by bubbling oxygen-free nitrogen through it, and degassing by applying a vacuum to it (col. 8, lines 12-14).

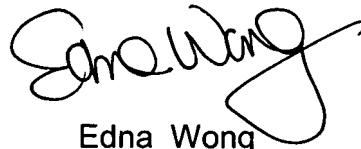
Plambeck appears to disclose a degassing step at least in a similar manner as

instantly claimed. Therefore, one having ordinary skill in the art would have expected that applying a vacuum to the solution would have reduced the amount of remaining oxygen because similar processes can reasonably be expected to yield similar results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Edna Wong", with a stylized flourish extending from the end.

Edna Wong
Primary Examiner
Art Unit 1795

EW
October 3, 2007